

REMARKS

The Office Action of April 30, 2010, was received and carefully reviewed. Claims 1-47 were pending in this application prior to this amendment. By this amendment, claims 1-4, 8, 12, 13, 18, 19, 21, 22, 25, 31, 36, 37, 43 and 44 are amended. No new matter has been added. Thus, claims 1-47 are currently pending for consideration.

Advisory Action

The Examiner notes in the Advisory Action dated July 13, 2010, that “newly added claim limitations in claims 8, 25-27, 32 and 37 require further search/consideration.” However, Applicants did not submit claim amendments in the Request for Reconsideration dated June 25, 2010. Instead, it appears that the Examiner is referring to amendments filed on February 12, 2010, and entered in the Office Action of April 30, 2010. Thus, Applicants respectfully request clarification of the Examiner’s remarks regarding claims 8, 25-27, 32 and 37.

In the Advisory Action, the Examiner asserts that “[U.S. Pat. Pub. No. 2002/0104995 to] Yamazaki discloses everything except the photocatalyst layer; and [U.S. Pat. Pub. No. 2003/0059717 to] Tabuchi discloses using a photocatalyst layer in an analogous device”. Applicants respectfully disagree. Applicants submit that the device of Tabuchi (a printing device using liquid-phase processes when used) cannot be considered as analogous to the device of Yamazaki (a semiconductor device manufactured by using vapor-phase processes). Further, a person skilled in the semiconductor arts, even if aware of Tabuchi, would not consider it evident that the photoconductor layer used in Tabuchi for its hydrophilic property (i.e., relating to liquid), would enhance adhesion of metal in vapor phase at its surface.

Claim Rejections under 35 U.S.C. §103

Claims 1-11

Claims 1, 5-7, 9 and 11 are rejected under 35 U.S.C. §103(a) as being unpatentable over Yamazaki in view of Tabuchi. Claims 2 and 8 are rejected under 35 U.S.C. §103(a) as being unpatentable over Yamazaki in view of Tabuchi, and further in view of U.S. Pat. Pub. No. 2004/0160167 to Arai (“Arai”). Claims 3 and 4 are rejected under 35 U.S.C. §103(a) as being unpatentable over Yamazaki in view of Tabuchi and Arai, and further in view of U.S. Pat. Pub. No. 2003/0168966 to Kobayashi (“Kobayashi”). Claim 10 is rejected under 35

U.S.C. §103(a) as being unpatentable over Yamazaki in view of Tabuchi, and further in view of U.S. Pat. Pub. No. 2005/0088106 to Suh (“Suh”).

With respect to these rejections, Applicants have amended claims 1-4 and 8 to further distinguish the claimed invention from the cited references. For example, Applicants have amended claims 2-4 to recite “a convex curved surface from an edge to an opposite edge”. This feature is not disclosed, suggested, or rendered obvious by Arai. Similarly, Applicants have amended claim 1 to include the same limitation, and to remove the limitation specifying that a photocatalyst is formed on the substrate.

Further, Applicants have added a limitation into claims 1-4 that “the thickness of the first gate electrode decreases continuously from a center portion of the first gate electrode to an edge of the first gate electrode”. This characteristic shape is illustrated, for example, in FIG. 1A of Drawings as filed. Claim 8 has been amended to recite that “the first electrode is connected to a second drain electrode of the second transistor by a columnar conductive film having a stacked structure”. This feature corresponds to, for example, element 117 of FIG. 2D. Applicants submit that none of Yamazaki, Tabuchi, Arai, Kobayashi, and/or Suh, taken alone or in combination, disclose, suggest, or render obvious the claimed gate electrode structure of amended claims 1-4 and 8.

Claims 12-17 and 42-47

Claims 12-17, 43 and 47 are rejected under 35 U.S.C. §103(a) as being unpatentable over Yamazaki in view of Tabuchi, and further in view of U.S. Pat. Pub. No. 2004/0216324 to Nakamura (“Nakamura”). Claims 42 and 44-46 are rejected under 35 U.S.C. §103(a) as being unpatentable over Yamazaki in view of Tabuchi and Nakamura, and further in view of U.S. Pat. Pub. No. 2001/0044259 to Akedo (“Akedo”).

With respect to these rejections, Applicants have amended claims 12 and 13 to introduce the limitation that “the thickness of the first conductive film decreases continuously from a center portion of the first conductive film to an edge of the first conductive film”. This characteristic shape is illustrated, for example, in FIG. 1A of the Drawings as filed.

The Examiner asserts that the cited references disclose the use of liquid composition in regions surrounded by structures forming banks such as pixel regions. However, the claimed invention is not limited to this formation, as is seen in the above-mentioned characteristic shape. Further, a “thickness [that] decreases continuously”, such as that recited in claims 12 and 13, implies an absence of angles on the top surface of the layer. Applicants

submit that none of Yamazaki, Tabuchi, Nakamura, and/or Akedo, taken alone or in combination, disclose, suggest, or render obvious the claimed structures of conductor materials of amended claims 12 and 13.

In addition, Applicants have amended claim 44 to specify that the conductive film has a columnar shape and has its side portions covered with an insulating film. Further, Applicants have amended claim 44 to specify that the top surface of the columnar conductive film is planarized by a means for spraying gas. These amendments are supported by, for example, elements 117 and 118 in FIGS. 2C and 2D of the Drawings as filed. None of Tabuchi, Nakamura, and/or Akedo disclose, suggest, or render obvious this combination of features recited in amended claim 44. In fact, such a combination is possible only by the specific fabrication processes disclosed in the subject application.

Claims 18-22 and 23-41

Claims 18-22 and 25-41 are rejected under 35 U.S.C. §103(a) as being unpatentable over Yamazaki in view of Tabuchi, Nakamura, and U.S. Pat. Pub. No. 2003/0210361 to Kiguchi (“Kiguchi”). Claim 23 is rejected under 35 U.S.C. §103(a) as being unpatentable over Yamazaki in view of Tabuchi, Nakamura and Kiguchi, and further in view of Japanese Pat. Pub. No. 2001-281438 to Natsuo (“Natsuo”). Claim 24 is rejected under 35 U.S.C. §103(a) as being unpatentable over Yamazaki in view of Tabuchi, Nakamura and Kiguchi, and further in view of U.S. Pat. Pub. No. 2003/0165714 to Lee (“Lee”).

Applicants have amended claims 18, 19, 21, 22, 25, 36 and 37 to recite the feature “wherein the thickness of the first gate electrode decreases continuously from a center portion of the first gate electrode to an edge of the first gate electrode”. Claim 31 has been similarly amended with respect to a first source electrode. Applicants submit that none of Tabuchi, Nakamura, and/or Kiguchi disclose, suggest, or render obvious this feature, for at least the same reasons discussed above with respect to claims 12 and 13.

Further, with respect to these claims, Applicants note that a conventional procedure to connect two conductive films separated by an interlayer insulating film consists of forming the interlayer insulating film over a first conductive film, forming a contact hole by etching a region of the interlayer conductive film, then forming (by evaporation or sputtering, for example) a second conductive film connected to the first one through the contact hole.

On the other hand, claims 18, 31, 36 and 37 recite forming a columnar conductive film, then forming an interlayer conductive film. This feature is illustrated in FIGS. 2A-D,

and described in paragraphs [0107] and [0108] of the Specification. In addition, the columnar film of and the second conductive film of the claimed invention are formed in separate steps. Claims 18, 31, 36 and 37 are further amended to specify that the insulating film covers “a side portion of the columnar conductive film”, a feature that is not disclosed, suggested, or rendered obvious by Tabuchi, Nakamura, and/or Kiguchi, taken alone or in combination.

Further distinct from the conventional procedures described above, claim 19 recites forming a columnar film by droplet. Claim 22 describes a method wherein no etching step is necessary, and instead teaches the removal of a columnar organic film 128 after the first insulating film has been formed, thereby forming a contact hole allowing contact between the conductive films. This feature is illustrated in FIGS. 5A-5C and described in paragraphs [0139]-[0141] of the Specification. Claim 25 teaches the use of an organic film repellent to a first insulating film to prevent formation of the first insulating film where a contact has been made, as is illustrated in FIG. 6A and described in paragraphs [0147]-[0150] of the Specification. None of these features are disclosed, suggested, or rendered obvious by Tabuchi, Nakamura, and/or Kiguchi, taken alone or in combination.

Claims 36 and 37 further relate to forming a conductive film in the contact hole to connect the first source electrode or the first drain electrode of the first transistor to the second gate electrode of the second transistor. This function is conventionally performed using vacuum-related techniques, such as sputter or evaporation. The cited references disclose the use of liquid composition in regions surrounded by structures forming banks such as pixel regions. Unlike the cited references, the claimed invention is not limited to such uses.

Conclusion

Therefore, none of Yamazaki, Tabuchi, Arai, Kobayashi, Suh, Nakamura, Akedo, Kiguchi, Natsuo, and/or Lee, taken alone or in combination, disclose, teach, suggest, or render obvious the invention recited in independent claims 1-4, 12, 13, 18, 19, 21, 22, 25, 31, 36, 37 and 44. Applicants submit, therefore, that the rejection of these claims is improper, and should be withdrawn. The rejection of dependent claims 5-11, 14-17, 20, 23, 24, 26-31, 32-35, 38-43 and 45-47 is also believed to be improper for at least the reasons discussed above with respect to the independent claims by virtue of their dependency thereon. Thus, in

view of the foregoing, Applicants contend that independent claims 1-4, 12, 13, 18, 19, 21, 22, 25, 31, 36, 37 and 44, as well as the claims depending therefrom, are allowable.

If a conference would be helpful in expediting prosecution of the instant application, the Examiner is invited to telephone the undersigned to arrange such a conference.

Respectfully submitted,

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